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ABSTRACT

The purposes of the test guide are threefold. First, it is intended to outline the scope of the basic aeronautical knowledge requirements for a glider flight instructor. This includes fundamentals of flight instruction and performance and analysis of flight training maneuvers. Secondly, it is intended to acquaint the applicant with source material that may be used to acquire this basic knowledge. A list of such material is provided in the first appendix. Lastly, a sample test, answers, and explanations are provided the applicant in a second appendix. An order form and instructions for ordering study materials is included. (AG)

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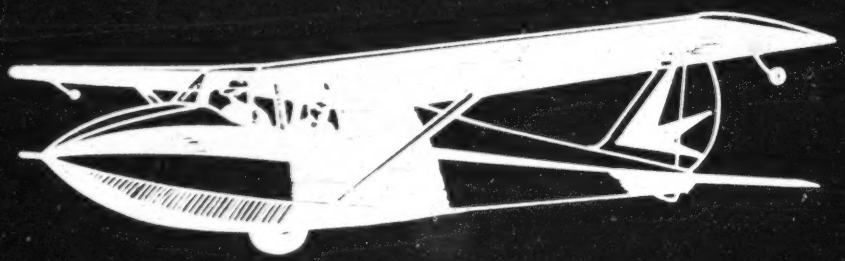
AC 61-41A

GLIDER FLIGHT INSTRUCTOR WRITTEN TEST GUIDE



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DEPARTMENT OF TRANSPORTATION
FEDERAL AVIATION ADMINISTRATION

AC NO: AC 61-41A

DATE: 12 Jan 72

ADVISORY CIRCULAR

DEPARTMENT OF TRANSPORTATION
FEDERAL AVIATION ADMINISTRATION

SUBJECT: GLIDER FLIGHT INSTRUCTOR WRITTEN TEST GUIDE

1. PURPOSE. This advisory circular is being issued to

   a. Outline the scope of the basic aeronautical knowledge requirements for a glider flight instructor,

   b. Acquaint the applicant with source material that may be used to acquire this basic knowledge, and

   c. Present a sample test along with correct answers and explanations.

2. CANCELLATION.

   AC 61-41, effective 7 November 1968, is canceled.

3. HOW TO GET THIS PUBLICATION.

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      FAA Advisory Circular AC 61-41A
      Glider Flight Instructor Written Test Guide

R. F. SLIFF
Acting Director,
Flight Standards Service

Initiated by: AC-240

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CHAPTER 1. NATURE OF THE WRITTEN TEST

1. INTRODUCTION. This guide is not offered as a quick and easy way to obtain the necessary knowledge to pass the written test. There is no quick and easy way to obtain the background of aeronautical knowledge, experience, and skill that the professional flight instructor should acquire in order to provide the high quality of training necessary to transform today's student into tomorrow's proficient pilot. Rather, the intent of this guide is to define the scope and narrow the field for study, insofar as possible, to the basic knowledge requisite to obtaining a flight instructor certificate.

2. CERTIFICATE REQUIREMENTS. The general qualifications for a flight instructor certificate require of the applicant a combination of aeronautical knowledge, experience, and skill. An applicant for a flight instructor certificate with a glider rating should carefully review the applicable sections of Federal Aviation Regulations, Part 61, for detailed information on these qualifications.

3. TYPE OF TEST. The Flight Instructor-Glider Written Test is necessarily comprehensive because the flight instructor should be knowledgeable in many areas. He should know not only "what" to do and "how" to do it; he should know also "why" a maneuver or procedure is performed in a certain way or order; what the results may be if the maneuver or procedure is not performed properly; and what elements of performance should be carried over from each training maneuver and procedure into the student's future day-to-day flying to ensure the safest possible pilot. It is generally accepted that a pilot with much knowledge but little skill is not adequately equipped for day-to-day flying. Today the pilot who is proficient in only the manipulative techniques of flying and lacking in aviation knowledge is not a very skillful airman with safety as his watchword.

   In addition to his aviation qualifications, the flight instructor should be a teacher. He should have an understanding of the learning process, the basic teaching principles, and the general application of these principles to teach his students effectively. There is much truth in the saying, "If there is no learning, there is no teaching."

   The glider flight instructor test is divided into two sections: Section 1, "Fundamentals of Flight Instruction" and Section 2, "Performance and Analysis of Flight Training Maneuvers." A detailed outline of the subject areas covered in each section appears later in this guide.

   The time required for the test is approximately four hours. Test items are of the objective, multiple-choice type, and each can be answered by the selection of a single item as the correct choice. This method conserves the applicant's time and the scorer's time, and eliminates the element of individual judgment in determining the grades.

4. TAKING THE TEST. In addition to being an exercise in the application and use of aeronautical knowledge, a test is also an exercise in communication since it involves the use of written language. Communication between individuals through the use of such abstract symbols as words is indeed a complicated process; so complicated, in fact, that at times communication may either break down or mislead if care is not exercised. The same word often means different things to different people. Carefully read the information and instructions in the written test.

Always bear in mind the following facts when you are taking the test:

a. The test items are not trick questions. Each statement means exactly what it says. Read each test item stem and each alternate response carefully, but do not look for hidden meanings. The correct statement does not concern exceptions to the rule; it refers to the general rule. However, the incorrect responses are often based on the exceptions.

b. Always read the test item stem first -- before you look at the alternate responses listed below it. Be sure you read the entire stem carefully, and understand its intent. Avoid "skimming" and hasty assumptions. This can lead to a completely erroneous approach to the test item or a failure to consider vital words.

c. Formulate your own answer before choosing from the list of alternate responses the one which you consider to be the best. Remember that only one of the alternate responses is completely correct. Others may be correct as far as they go, but are not complete or are answers based on erroneous assumptions, misconceptions, or incorrect procedures and interpretations.

d. If you find that you have considerable difficulty with a particular test item, do not spend too much time on it, but continue with the test and answer those items which are less difficult. Then go back and reconsider the test items you have passed over. This procedure will enable you to use the total time available to maximum advantage in demonstrating your knowledge and understanding of the subject.

NOTE: Comments regarding this publication should be directed to Department of Transportation, Federal Aviation Administration, Flight Standards Technical Division, P.O. Box 25082, Oklahoma City, Oklahoma 73125.

CHAPTER 2. STUDY OUTLINE FOR THE FLIGHT INSTRUCTOR GLIDER WRITTEN TEST

SECTION 1. FUNDAMENTALS OF FLIGHT INSTRUCTION

5. FLIGHT INSTRUCTOR'S HANDBOOK, AC 61-16A, (see Appendix 1, page 1) Applicants should familiarize themselves with the following pertinent chapters of this handbook:

NOTE: All specific references and examples in this handbook are based on airplanes; however, the general material is applicable to flight instructors in other aircraft categories.

a. Fundamentals of Teaching and Learning (Chapter I).

b. Effective Teaching Methods (Chapter II).

c. Aeromedical Information Important to Flight Instructors (Chapter IV).

d. The Flight Training Syllabus (Chapter VI).

e. Flight Instructor Responsibilities (Chapter VII).

SECTION 2. PERFORMANCE AND ANALYSIS OF FLIGHT TRAINING MANEUVERS

6. AERODYNAMICS AND PRINCIPLES OF FLIGHT.

a. Aerodynamic terms and definitions.

b. Axes of a sailplane.

c. Forces acting on a sailplane in flight.

d. Angle of attack.

e. Turns.

(1) Forces acting on an aircraft in a normal turn.

(2) Change of lift in a turn.

(3) Change of drag in a turn.

(4) Change of load factor in a turn.

(5) Slipping and skidding.

7. FLIGHT TRAINING MANEUVERS AND PROCEDURES.

a. Know how and when to introduce maneuvers and procedures.

b. Know the correct technique for the maneuvers and procedures.

c. Be able to recognize and analyze common student errors.

d. Be familiar with effective methods of correcting student errors.

e. Know the required maneuvers and procedures for the flight instructor flight test as given in FAR 61.173(b)(4).

f. Know and understand the flight maneuvers and procedures that should be taught to private and commercial pilot applicants.

g. Know and understand the scope of the aeronautical knowledge that should be taught to private and commercial pilot applicants.

8. SAILPLANE OPERATION AND PERFORMANCE.

a. The various airspeeds.

(1) Stalling.

(2) Buffeting.

(3) Minimum sinking.

(4) Best gliding angle.

(5) Towing.

(6) Maximum.

b. Operations limitations.

(1) Aircraft flight manual.

(2) Placards.

9. TOWING OPERATIONS.

a. Principles, techniques, and precautions of:

(1) Winch towing.

(2) Auto towing.

(3) Aero towing.

10. USE OF PILOT INFORMATION PUBLICATIONS.

a. Airman's Information Manual (see Appendix 1, page 2). Know how to use and interpret data contained in this important publication, such as:

(1) Air navigation radio aids.

(2) Airport and air navigation lighting and marking aids.

(3) Altimetry.

(4) Good operating practices.

(5) Radiotelephone phraseology and techniques.

(6) Safety of flight.

(7) Notices to Airmen (NOTAMS).

(8) Airport Directory.

(9) Airport/Facility Directory.

b. Glider Flight Manuals (see Appendix 1, page 1). Be able to interpret and use material in these manuals.

(1) Operating limitations and possible consequences if exceeded.

(2) Determine empty weight and compute useful load and gross weight.

(3) Interpret weight and balance data to determine that the glider is properly loaded.

(a) Adverse effects of improper CG (center of gravity).

(b) Use of ballast if necessary.

(4) Flight load factor limitations and airspeed limitations.

(5) Recommended towing and gliding speeds.

c. Federal Regulations governing aviation (see Appendix 1, page 2).

(1) National Transportation Safety Board, Safety Investigation Regulations, Part 430 -- Rules Pertaining to Aircraft Accidents, Incidents, Overdue Aircraft and Safety Investigations.

(2) Federal Aviation Regulations.

(a) Part 1 - "Definitions and Abbreviations."

(b) Part 61 - "Certification: Pilots and Flight Instructors."

(c) Part 91 - "General Operating and Flight Rules."

11. OTHER AREAS OF IMPORTANCE.

a. Thermal soaring.

b. Ridge soaring.

c. Wave soaring.

d. Strange field landings.

e. Flight instruments.

(1) Altimeter.

(a) Know the effect of nonstandard temperature and pressure on the indications of the altimeter.

(b) Understand how to obtain pressure altitude.

(c) Understand how to apply altimeter settings to the Kollsman window of the altimeter.

(d) Be able to interpret indications of the altimeter.

(2) Airspeed indicator.

(3) Vertical speed indicator.

(4) Gyro instruments -- turn-and-slip indicator and attitude indicator.

(5) Magnetic compass.

(a) Know how to read correctly and use to maintain direction.

(b) Know and understand the inherent errors.

f. Be able to use and interpret pertinent charts, such as:

(1) Density altitude chart.

(2) Load factor chart.

g. Know the effects of snow, ice, and frost on an airfoil, and realize the importance of removal prior to flight.

h. Dangers associated with aircraft wake turbulence (i.e., wing-tip and rotor-tip vortices; propeller, jet engine, and helicopter rotor wash).

(1) Conditions and circumstances most conducive to such turbulence.

(2) How to avoid these dangers.

(3) Procedure to use if inadvertently encountered.

i. Factors affecting performance.

(1) Density altitude.

(a) Elevation.

(b) Temperature.

(c) Moisture.

(d) Atmospheric pressure.

(2) Gross weight.

(3) Wind.

APPENDIX 1. RECOMMENDED STUDY MATERIALS

The applicant for the Glider Flight Instructor Rating will find the publications listed below helpful in his preparation for the test.

The list identifies source material that may be used to prepare for the test, but does not include all available material on the subjects. Other excellent textbooks, audiovisual training aids, and instruction materials useful in preparing for the test are available at bookstores and libraries.

It is the responsibility of each applicant to obtain the study materials appropriate to his needs.

NOTE: References listed were available at the time this publication went to press.

SECTION 1. LIST OF APPROPRIATE STUDY MATERIALS

1. FLIGHT INSTRUCTOR'S HANDBOOK, AC 61-16A ($1.25). This revised FAA handbook is one of the primary sources of information and guidance for pilots preparing for the flight instructor certificate and is also valuable as a reference text for certificated flight instructors. It is basically a book which deals with accepted theories and practices applicable to teaching and the learning process. As such, it is the primary reference text when preparing for the "Fundamentals of Instruction" section of the Flight Instructor Written Test.

2. FLIGHT TRAINING HANDBOOK, AC 61-21 ($1.25). This FAA text deals with certain basic flight information such as load factor principles, weight and balance, and related aerodynamic aspects of flight, as well as principles of safe flight. The balance of the book provides information and direction in the introduction and performance of training maneuvers. Thus it serves as a text for student pilots, pilots improving their qualifications or preparing for additional ratings, and flight instructors who are teaching. Although written primarily for the airplane pilot, much of it is adaptable to the glider pilot.

3. THE AMERICAN SOARING HANDBOOK

   a. THE AMERICAN SOARING HANDBOOK, CHAPTER 2 - TRAINING ($1.00).

   b. THE AMERICAN SOARING HANDBOOK, CHAPTER 3 - GROUND LAUNCH ($1.00).

   c. THE AMERICAN SOARING HANDBOOK, CHAPTER 4 - AIRPLANE TOW ($1.00).

   d. THE AMERICAN SOARING HANDBOOK, CHAPTER 5 - METEOROLOGY ($1.00).

e. THE AMERICAN SOARING HANDBOOK, CHAPTER 6 - CROSS COUNTRY AND WAVE SOARING ($1.00).

f. THE AMERICAN SOARING HANDBOOK, CHAPTER 7 - EQUIPMENT I, INSTRUMENTS AND OXYGEN ($1.00).

g. THE AMERICAN SOARING HANDBOOK, CHAPTER 8 - EQUIPMENT II, RADIO, ROPE AND WIRE ($1.00).

Published by the Soaring Society of America. This handbook represents the combined efforts of many of the veteran soaring pilots in this country. Each chapter is a separate booklet.

h. THE JOY OF SOARING ($5.75). A Training Manual, the latest in a series of publications by the Soaring Society of America, designed to promote not only enjoyment, but proficiency and safety in soaring activities. It supplements the American Soaring Handbook, and the monthly magazine "Soaring." It is the most comprehensive and authoritative description of training techniques available to the beginner or experienced pilot.

4. FEDERAL AVIATION REGULATIONS.

a. Part 1 - Definitions and Abbreviations.

b. Part 61 - Certification: Pilots and Flight Instructors.

c. Part 91 - General Operating and Flight Rules.

5. NATIONAL TRANSPORTATION SAFETY BOARD, SAFETY INVESTIGATION REGULATIONS, Part 430. Rules pertaining to aircraft accidents, incidents, overdue aircraft, and safety investigations. (Free - NTSB).

6. GLIDER FLIGHT MANUALS, OWNER'S MANUALS AND TRAINING MANUALS. Aircraft manufacturers issue Flight and/or Owner's Manuals for each aircraft model. They also often issue Training Manuals for their aircraft. These may be obtained from individual aircraft manufacturing companies or from local dealers and distributors.

7. AIRMAN'S INFORMATION MANUAL (AIM). The Airman's Information Manual has been designed primarily as a pilot's operational and information manual for use in the National Airspace System of the United States. It is divided into four basic parts, each of which may be purchased separately. Highlights of each part are described on the following pages.

PART 1 - Basic Flight Manual and ATC Procedures. This part is issued quarterly and contains basic fundamentals required to fly in the National Airspace System; adverse factors affecting Safety of Flight; Health and Medical Facts of interest to pilots; ATC information affecting rules, regulations and procedures; a Glossary of Aeronautical Terms; Air Defense Identification Zones (ADIZ); Designated Mountainous Areas; and Emergency Procedures. Annual subscription price $4.00 for U.S., Canada and Mexico, plus $1.00 for other foreign mailing.

PART 2 - Airport Directory. This part is issued semiannually and contains a Directory of all Airports, Seaplane Bases, and Heliports in the conterminous United States, Puerto Rico, and the Virgin Islands which are available for civil use. It includes all of their services, except communications, in coded form. (Those airports with communications are also listed in Part 3.)

Also included in Part 2 are U.S. Entry and Departure Procedures, including Airports of Entry and Landing Rights Airports and a listing of Flight Service Station and Weather Bureau Telephone Numbers. Annual subscription price $4.00 for U.S., Canada and Mexico, plus $1.00 for other foreign mailing.

PART 3 and 3A - Operational Data and Notices to Airmen. Part 3 is issued every 28 days and covers the conterminous U.S., Puerto Rico, and Virgin Islands.

Part 3 contains an Airport Facility Directory of all major airports with communications; a tabulation of Air Navigation Radio Aids; Preferred Routes; a listing of Standard Instrument Departures (SIDs); Standard Terminal Arrival Routes (STARs); Substitute Route Structures; Sectional Chart Bulletin (which updates C&GS Sectional Charts cumulatively); Special, General and Area Notices; a tabulation of New and Permanently Closed Airports (which updates Part 2); Area Navigation Routes; and supplemental data to Part 4. Part 3A is issued every 14 days and contains Notices to Airmen considered essential to the safety of flight, as well as supplemental data to Parts 3 and 4. Annual subscription price $20.00 for U.S., Canada and Mexico, plus $5.00 for other foreign mailing.

PART 4 - Graphic Notices and Supplemental Data. Part 4 is issued semiannually and covers the conterminous U.S., Puerto Rico, and the Virgin Islands.

Part 4 contains a list of abbreviations used in the AIM; a tabulation of Parachute Jump Areas; locations of VOR Receiver Check Points (both Ground and Airborne); Restrictions to Enroute Navigation Aids; Special Notice--Area Graphics; and Heavy Wagon and Oil Burner Routes. Future editions will be expanded to include additional Terminal Area Graphics and other data not requiring frequent change. Annual subscription price $1.50 for U.S., Canada and Mexico, plus $0.50 for other foreign mailing.

* * * * * * * *

NOTE: Similar information for Alaska and Hawaii appears in Alaska Supplement and Pacific Chart Supplement, respectively (for Part 2, Parts 3 and 3A, and Part 4).

WHERE TO PURCHASE AIM

The four basic parts described above are available from the Superintendent of Documents, Government Printing Office, Washington, D.C. 20402. Orders should be accompanied by check or money order made payable to the Superintendent of Documents.

SECTION 2. HOW TO OBTAIN STUDY MATERIALS

8. THE AMERICAN SOARING HANDBOOK and THE JOY OF SOARING may be obtained from bookstores, sailplane operators, or ordered from:

The Soaring Society of America
Box 66071
Los Angeles, California 90066

9. OTHER STUDY MATERIALS. You may obtain a copy of the FAA Advisory Circular Checklist and Status of Federal Aviation Regulations, as shown in the Federal Register, free of charge upon request from:

Distribution Unit, TAD-484.3
Department of Transportation
Washington, D.C. 20590

This checklist contains Advisory Circulars that are for sale, as well as those distributed free of charge by the FAA. When a price is listed after the description of a circular, it means that this circular is for sale by the Superintendent of Documents, U.S. Government Printing Office.

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(1) Use an order form, not a letter, unless absolutely necessary. Order forms may be duplicated by the user. See sample Order Blank on next page.
(2) Send separate orders for a subscription and a nonsubscription item.
(3) Get the exact name of the publication and the agency number.
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APPENDIX 2. SAMPLE TEST

The following test items are only samples to indicate the general form of those used in the test. They are included for one purpose -- to familiarize you with the type of test items you may expect to find on FAA tests. Ability to answer these sample items does not indicate that you are fully prepared to take the test since all topics on which you will be tested are not included.

You should concentrate on the section of this study guide entitled "Study Outline for the Flight Instructor-Glider Written Test." A knowledge of all the topics mentioned in this outline -- not just the mastery of the sample test items -- should be used as the criterion for determining that you are properly prepared to take the FAA written test. Proper preparation requires considerable time, effort, and the guidance of a competent instructor.

Correct answers to the sample test items, along with an explanation of each item, are on pages 5 and 6 in this Appendix.

SECTION 1. FUNDAMENTALS OF FLIGHT INSTRUCTION

1. Motivation is a key factor in learning. In properly motivating students, a flight instructor should remember that

    1- students are innately able to evaluate their proficiency and rate of progress and will instinctively tend to arrive at correct self-concepts if properly motivated.
    2- it is best to emphasize long-range goals more than short-range goals.
    3- positive motivations are characteristically more effective than negative motivations.
    4- all of the above statements are considered true.

2. Worry and emotional difficulties, which are sometimes associated with flight training, are usually a result of

    1- personality problems of the student affected.
    2- inadequacies in the training course or flight instructor.
    3- personality conflicts between student and instructor.
    4- the type of maneuvers, or the phase of training with which the student is concerned at the time the difficulties arise.

3. A planned flight syllabus will be effective only if it

    1- is personally prepared by the instructor.
    2- is written out.
    3- provides for step-by-step learning.
    4- covers training maneuvers that are objectives in themselves.

4. Flight instructors should understand that plateaus or slumps in a student's rate of learning

   1- seldom occur; but when they do, are most likely to occur when the student reaches the advanced phase of instruction.
   2- seldom occur and then only during the pre-solo stage.
   3- are normal situations and are more likely to occur as the student advances to more complicated maneuvers.
   4- occur frequently because students will not practice maneuvers they do not enjoy.

5. On which of the following is the teaching success of a flight instructor considered to be most dependent?

   1- Personality of the instructor.
   2- Presentation by the instructor.
   3- Flying ability and flight experience.
   4- Proper planning of lessons.

6. The most effective level of communication (teaching) normally occurs when an instructor provides the student with

   1- all facts and knowledge pertaining to a learning problem.
   2- appropriate facts and knowledge in a manner which assures that the student receives it accurately.
   3- appropriate facts and knowledge in a manner which assures student understanding.
   4- facts and knowledge in such a way that his behavior is properly affected.

7. Which of the following is most often the cause of poor student performance in learning to fly a glider?

   1- Negative transfer.
   2- Ignorance of correct procedures.
   3- Fear, anxiety and phobia.
   4- Faulty habit patterns.

8. The process of learning by "trial and error"

   1- encourages the development of insight by students.
   2- teaches the relationship between perceptions as they occur.
   3- can be improved through proper supervision.
   4- results in having students practice their mistakes.

SECTION 2. PERFORMANCE AND ANALYSIS OF FLIGHT TRAINING MANEUVERS

9. The greatest danger that may be encountered when a glider is being airplane-towed in a low-tow position is the

   1- possibility of the towline fouling the glider in the event of a towline failure.
   2- additional stress on the towline due to the glider being towed "up-hill."
   3- difficulty encountered in entering the low-tow position after takeoff.
   4- loss of the glider pilot's horizon reference to help maintain tow position.

10. How should you teach your student to maintain the same bank as the towplane?

   1- By comparing the wings of the sailplane and the towplane.
   2- By observing how the top of the instrument panel lines up with the towplane's wings.
   3- Tell him not to worry about it since the sailplane will follow in the towplane's path anyway.
   4- With neutral control positions, the sailplane wings will automatically assume the same bank as the towplane.

11. If the glider is allowed to gain too much altitude before the towplane becomes airborne on takeoff, it may

   1- impose excessive stresses on the wings of the glider.
   2- cause the glider to stall.
   3- decrease the towplane's takeoff performance due to forcing the towplane into an abnormal takeoff attitude.
   4- cause the towplane to ground loop on takeoff.

12. In a glider, all stalls are caused by

   1- misuse of the elevators.
   2- exceeding the critical angle of attack.
   3- insufficient speed.
   4- exceeding the critical angle of pitch.

13. Most sailplanes are equipped with spoilers. The primary purpose of spoilers on sailplane wings is to

   1- decrease lift.
   2- increase drag.
   3- change the camber of the wings.
   4- decrease airspeed.

14. When a flight instructor demonstrates the wing low technique for drift correction during a landing, he should show the student that it is best to

    1- level the wings just prior to touchdown.
    2- release all cross control pressures at the time contact is made with the ground.
    3- touchdown with the upwind wing down a correct amount to compensate for drift, provided the wind is not so strong that the wing tip would drag.
    4- establish a heading slightly into the crosswind to compensate for leveling the wings just prior to contact with the ground.

15. During air tows in straight and level flight, your student unintentionally permits the glider to move to one side of the towplane. This situation is probably the result of

    1- strong crosswind conditions.
    2- flying the glider with a wing low.
    3- variations in the heading of the towplane.
    4- the spiral path of the towplane's slipstream striking the keel surfaces of the glider.

16. Flying a sailplane in the vicinity of a busy airport could create a problem with wing-tip vortices. The intensity of the vortices associated with the wake turbulence of large aircraft is greatest when such airplanes are operating at

    1- low airspeeds and low gross weights.
    2- high airspeeds and high gross weights.
    3- low airspeeds and high gross weights.
    4- high airspeeds in strong winds aloft conditions.

SECTION 3. ANSWERS AND EXPLANATION TO SAMPLE TEST ITEMS

1. (Ans. 3). The Flight Instructor's Handbook, AC 61-16A, states, "Negative motivations . . . are not characteristically as effective in promoting efficient learning as are positive motivations."

2. (Ans. 2). The Flight Instructor's Handbook, AC 61-16A, states, "Worries and emotional upsets which result from the course at hand can be remedied. Such occurrences are usually evidence of inadequacies on the part of the course or of the instructor concerned."

3. (Ans. 3). The Flight Instructor's Handbook, AC 61-16A, states, "The flight syllabus should provide a step-by-step progression of learning, with provision for regular review and evaluation . . . ."

4. (Ans. 3). The Flight Instructor's Handbook, AC 61-16A, states, "Temporary random plateaus in the learning rate are not necessarily serious, and can be expected with any student . . . Slumps or plateaus in the rate of learning are more likely to occur as a student advances to more complicated operations . . . ."

5. (Ans. 4). The Flight Instructor's Handbook, AC 61-16A, states, "Teaching success depends more upon lesson planning than it does on presentation, personality, flying ability, or experience."

6. (Ans. 4). The Flight Instructor's Handbook, AC 61-16A, states, "Communication at the understanding level goes far beyond the receipt of information; ideas must be comprehended. Understanding is a higher type of communication than is the mere acquisition of facts. To be effective, however, the flight instructor must go beyond this level of communication. Effective communication requires that information be provided in such a way that it affects the behavior of the student."

7. (Ans. 4). The Flight Instructor's Handbook, AC 61-16A, states, "Reversals sometimes occur, during which a student's performance becomes worse with continued practice. Generally such reversals are due to a faulty habit pattern involving one of the basic elements of the maneuver or operation involved."

8. (Ans. 3). The Flight Instructor's Handbook, AC 61-16A, states, "Insights will almost always occur eventually, whether or not instruction is provided. For this reason it is possible for a person to become a pilot by trial and error if he supervises his exploratory actions, just as one may become a lawyer by 'reading law.' Instructions, however, speeds this learning process by teaching the relationship of perceptions as they occur, and so promoting the development of insights by the student."

9. (Ans. 1). The American Soaring Handbook, Chapter 4, "Airplane Tow," states: "If the towline should be released from the towplane or broken near the towplane when the sailplane is in low tow, the rope and the rope end could possibly inflict damage on the sailplane."

10. (Ans. 2). The American Soaring Handbook, Chapter 4, "Airplane Tow," states: "The sailplane pilot should compare his angle of bank with that of the towplane by observing how the top of his instrument panel lines up with the wing of the plane and not by looking at his wings."

11. (Ans. 3). The American Soaring Handbook, Chapter 4, "Airplane Tow," states: "The sailplane pilot can make it difficult, even impossible, for the towplane to take off if he allows his sailplane to get so high that the tow rope pulls up on the tail of the towplane. This is a dangerous situation. . . ."

12. (Ans. 2). The American Soaring Handbook, Part 1, Chapter 2, "Training," states: ". . .the thing which causes a stall is that the angle of attack . . .exceeds a limiting value and the air flow separates from the top surface."

13. (Ans. 1). The Joy of Soaring Manual of Instruction, Chapter 2, states, "The prime purpose of spoilers is to break up the smooth flow of air over a portion of the wing, 'spoiling' the lift. . . . The choice of names depends on whether the accent is on decreasing lift (spoilers) or increasing drag (dive brakes)."

14. (Ans. 3). The American Soaring Handbook, Chapter 2, "Training," states: "While on the final approach for a crosswind landing a combination of crabbing into the wind and an upwind-wing-low slip will keep the path of flight lined up with the runway. Near the ground the wind is less and the slip alone will usually maintain the desired track. By using the correct amount of side slip the sailplane can be landed with one wing low and with the wheel rolling straight down the runway without drifting."

15. (Ans. 2). The Joy of Soaring Manual of Instruction, Part 1, Chapter 5, states: "If the glider does move out to one side of the towplane, the glider pilot has to decide whether he is holding a wing down (most probable), pushing on a rudder pedal without realizing it, or both."

16. (Ans. 3). The Airman's Information Manual, Part 1, states: "The strength of a vortex is governed primarily by the weight, speed, and shape of the wing of the generating aircraft. The basic factor is weight, and the vortex strength increases with increases in weight and span loading. . . . The greatest vortex strength occurs when the generating aircraft is HEAVY-CLEAN-SLOW."